

# **TEST RESULTS and REPORT**

**for**

**LIBUS PPE**

**NEON**

by



**COLTS** | Laboratories™

Precision Testing. Definitive Results.

**COLTS Laboratories maintains A2LA accreditation to ISO/IEC 17025 for the tests listed on Certificate # 1612.01.  
Any tests not included on this certificate have been identified on the appropriate test result page.**

**Also Certified for testing by the Safety Equipment Institute**

**Z-LIB111220-03**

- Unless otherwise stated, results in this report apply only to the samples tested and not to lots from which they were taken.
- This report shall not be reproduced, except in full, without written approval from COLTS Laboratories.
- Unless otherwise requested, test samples will be discarded 21 days from the report date.

**COLTS Laboratories**

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**PRODUCT  
RESULTS  
SUMMARY**

A2LA Accredited Certificate # 1612.01

**LIBUS PPE  
LIB111220-03**

<b>COLTS Project ID</b>	<b>Test/Models(s)</b>	<b>Results Pass / Fail</b>	<b>Reason</b>	<b>Page</b>
Z-LIB111220-03-01	ANSI Z87.1-2020 Spectacle Base Model General Requirements NEON Clear Lens, Clear Temples (+)	Pass		1
Z-LIB111220-03-02	ANSI Z87.1-2020 Spectacle Optional Claim (+) NEON Clear Lens, Clear Temples (+)	Pass		5
Z-LIB111220-03-03	ANSI Z87.1-2020 Spectacle Variant General Requirements NEON Smoke Lens, Gray Temples (+S)	Pass		8
Z-LIB111220-03-04	ANSI Z87.1-2020 Spectacle Optional Claim (+) NEON Smoke Lens, Gray Temples (+)	Pass		12

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**Report  
Summary**

A2LA Accredited Certificate # 1612.01

**Report To:**

LIBUS PPE  
Calle 21 Nro. 1213  
Berazategui, Bs.As. Argentina

**Project**

of Model(s): NEON  
Report of: ANSI Z87.1-2020  
Project ID(s): Z-LIB111220-03-01



**Attn:** Miguel Caro

**Date:** December 23, 2020

**Product Description:** Clear Lens, Clear Temples (+)

On November 12, 2020, COLTS Laboratories received Spectacles: NEON from LIBUS PPE . From November 30, 2020 through December 22, 2020 COLTS Laboratories tested these Spectacles in accordance with ANSI Z87.1-2020 to the following test protocol: ANSI Z87.1-2020 Spectacle Base Model General Requirements.

Detailed test results are included.

**Final Conclusion:**

The Spectacles: NEON (Clear Lens, Clear Temples (+)) do comply with ANSI Z87.1-2020 for the test(s) included in this report.

COLTS makes all statements of conformity (Pass/Fail) based on actual values reported, unless otherwise stated.

Please contact us should you have any questions concerning this report.

**Respectfully submitted,**

COLTS Laboratories

Daryl Neely  
Vice-President & COO

Dale Payne  
Technical Services Manager

Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-01



Sample ID:  
 NEON  
 Clear Lens, Clear Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

## Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Optical Quality	5.1.1	Protector lenses shall be free of: striae, bubbles, waves and other visible defects which would impair the wearer's vision.	Acceptable	Pass
Luminous Transmittance	5.1.2	Clear lenses shall have a luminous transmittance of not less than 85%. Luminous Transmittance	Acceptable	Pass
		Left Eye	92.5%	Pass
		Right Eye	92.7%	Pass
Haze – Clear Lenses Only	5.1.3	Clear plano lenses shall not exhibit more than 3% haze. Haze	Acceptable	Pass
		Left Eye	0.19%	Pass
		Right Eye	0.19%	Pass
Spectacle - Refractive Power, Astigmatism, Resolving Power, Prism and Prism Imbalance for Plano Protectors	5.1.4	The tolerance on refractive power, astigmatism, resolving power, prism and prism imbalance shall be as indicated below. Filter lenses of shade 9 or higher are exempt from this section.		
		Refractive Power ( $\pm 0.06$ )	Acceptable	Pass
		Left Eye	+0.02	Pass
		Right Eye	+0.03	Pass
		Astigmatism (0.06 Max)	Acceptable	Pass
		Left Eye	0.06	Pass
		Right Eye	0.06	Pass
		Resolving Power (Pattern 20)	Acceptable	Pass
		Left Eye	Acceptable	Pass
		Right Eye	Acceptable	Pass
		Complete Prism (0.50 Max)	Acceptable	Pass
		Left Eye	0.071	Pass
		Right Eye	0.100	Pass
		Prismatic Imbalance	Acceptable	Pass
		Vertical (0.25 Max)	0.05	Pass
		Horizontal Base In/Out (In 0.25 Max; Out 0.50 Max)	0.05 in	Pass

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Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-01



Sample ID:  
 NEON  
 Clear Lens, Clear Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

**Report of: ANSI Z87.1-2020**

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Physical Requirements	5.2	Protectors shall be free from: projections, sharp edges or other defects which are likely to cause discomfort or injury during use.	Acceptable	Pass
Ignition (Spectacle)	5.2.2	Protectors shall not ignite or continue to glow once the rod is removed. Each externally exposed material (exclusive of metals, textiles or elastic bands) shall be tested.		
		Lens	Acceptable	Pass
		Front	N/A	N/A
		Temple	Acceptable	Pass
		Other	N/A	N/A
Corrosion Resistance of Metal Components	5.2.3	Metal components used in protectors shall be corrosion resistant to the degree that the function of the protector shall not be impaired by the corrosion and the protector can be worn as intended. Lenses and electrical components are excluded from these requirements. Corrosion Resistant	Acceptable	Pass
Minimum Coverage Area	5.2.4	Protectors shall cover an area of not less than 40 mm in width and 33 mm in height (elliptical) in front of each eye, centered on the pupil centers of the test headform.		
		Protectors designed for small head sizes shall cover an area of not less than 34 mm in width and 28 mm in height (elliptical), centered on the pupil centers of the test headform. Minimum Coverage Area	Acceptable	Pass
Placement of Markings (Spectacles)	5.3.2	All protectors shall bear the permanent and legible markings in specified locations. Markings for lens type and use applications shall be required only when claims for protection against the hazard or indicated use are made by the manufacturer. Protector markings shall be placed in relatable proximity to each other on the product in the sequence specified below: Markings permanent, legible and in relatable proximity and in the correct sequence.	N/A	N/A
		Markings representative of other standards shall not interfere with or be intermixed with the markings required by this standard.	N/A	N/A

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Sample ID:  
 NEON  
 Clear Lens, Clear Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

**Report of: ANSI Z87.1-2020**

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Placement of Markings (Spectacles)	5.3.2	All protectors shall bear the permanent and legible markings in specified locations.		
		Markings for lens type and use applications shall be required only when claims for protection against the hazard or indicated use are made by the manufacturer.		
		Protector markings shall be placed in relatable proximity to each other on the product in the sequence specified below:		
		Complete Device Markings	N/A	N/A
		Manufacturer's Mark or Logo	N/A	N/A
		Z87 Mark (Z87-2 for Rx)	N/A	N/A
		+ Mark	N/A	N/A
		Lens Type (multiple claim sequence W,U,L,R,V,S)	N/A	N/A
		Markings not assessed per customer request		
Aftermarket Components and Accessories	5.6	All original equipment manufacturers (OEM) and non-OEM aftermarket components or accessories not sold with the original device shall be tested.		
		The entity claiming compliance of the component or accessory is responsible for testing the original complete device assembled with the components or accessories and shall provide evidence of compliance upon request.		
		Aftermarket Components and Accessories	Manufacturer requirement	Not testable

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**Report  
Summary**

A2LA Accredited Certificate # 1612.01

**Report To:**

LIBUS PPE  
Calle 21 Nro. 1213  
Berazategui, Bs.As. Argentina

**Project**

of Model(s): NEON  
Report of: ANSI Z87.1-2020  
Project ID(s): Z-LIB111220-03-02



**Attn:** Miguel Caro

**Date:** December 23, 2020

**Product Description:** Clear Lens, Clear Temples (+)

On November 12, 2020, COLTS Laboratories received Spectacles: NEON from LIBUS PPE . From November 30, 2020 through December 22, 2020 COLTS Laboratories tested these Spectacles in accordance with ANSI Z87.1-2020 to the following test protocol: ANSI Z87.1-2020 Spectacle Optional Claim (+).

Detailed test results are included.

**Final Conclusion:**

The Spectacles: NEON (Clear Lens, Clear Temples (+)) do comply with ANSI Z87.1-2020 for the test(s) included in this report.

COLTS makes all statements of conformity (Pass/Fail) based on actual values reported, unless otherwise stated.

Please contact us should you have any questions concerning this report.

**Respectfully submitted,**

COLTS Laboratories

Daryl Neely  
Vice-President & COO

Dale Payne  
Technical Services Manager

Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-02



Sample ID:  
 NEON  
 Clear Lens, Clear Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

## Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Lateral (Side) Coverage	7.1.3	Impact-rated protectors shall provide continuous lateral coverage. The probe shall not contact the headform within the defined coverage area. Lateral (Side) Coverage	Acceptable	Pass
High Mass Impact	7.1.4.2	The complete device shall meet the protector acceptance criteria when impacted by a pointed projectile weighing a minimum of 500 g (17.6 oz) dropped from a height of at least 127 cm (50.0 in.).  The lens shall fail if any of the following occurs: <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained</li> </ul>		
		Left Eye Sample 1	Acceptable	Pass
		Left Eye Sample 2	Acceptable	Pass
		Right Eye Sample 3	Acceptable	Pass
		Right Eye Sample 4	Acceptable	Pass
High Velocity Impact (Spectacle)	7.1.4.3	The complete device shall meet the protector acceptance criteria when impacted by a 6.35 mm (0.25 in) diameter steel ball traveling at a minimum of 150 feet per second.  When tested in accordance with this section, the lens shall fail if any of the following occurs: <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained;</li> <li>the unaided eye observes any piece adhering to the contact paste, or observes contact paste on the projectile or complete device.</li> </ul>		
		Left Eye Center	155 fps	Pass
		Left Eye 30°	155 fps	Pass
		Right Eye Center	154 fps	Pass

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Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-02



Sample ID:  
 NEON  
 Clear Lens, Clear Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

**Report of: ANSI Z87.1-2020**

Test/Property	Paragraph	Requirement	Test Results	Acceptance	
High Velocity Impact (Spectacle)	7.1.4.3	<p>The complete device shall meet the protector acceptance criteria when impacted by a 6.35 mm (0.25 in) diameter steel ball traveling at a minimum of 150 feet per second.</p> <p>When tested in accordance with this section, the lens shall fail if any of the following occurs:</p> <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained;</li> <li>the unaided eye observes any piece adhering to the contact paste, or observes contact paste on the projectile or complete device.</li> </ul>			
			Right Eye 30°	155 fps	Pass
			One Side 90° at 10mm Above (H - 8mm)	155 fps	Pass
			Opposite Side 90° at 10mm Below (H - 8mm)	155 fps	Pass
Penetration Test (lenses only)	7.1.4.4	<p>Lenses for all complete devices shall meet the protector acceptance criteria when penetrated by a weighted needle with a minimum total weight of 44.2 g (1.56 oz) dropped from a height of at least 127 cm (50.0 in.).</p>			
			Left Eye Sample 1	Acceptable	Pass
			Left Eye Sample 2	Acceptable	Pass
			Right Eye Sample 3	Acceptable	Pass
			Right Eye Sample 4	Acceptable	Pass

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Summary**

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Berazategui, Bs.As. Argentina

**Project**

of Model(s): NEON  
Report of: ANSI Z87.1-2020  
Project ID(s): Z-LIB111220-03-03



**Attn:** Miguel Caro

**Date:** December 23, 2020

**Product Description:** Smoke Lens, Gray Temples (+S)

On November 12, 2020, COLTS Laboratories received Spectacles: NEON from LIBUS PPE . From November 30, 2020 through December 22, 2020 COLTS Laboratories tested these Spectacles in accordance with ANSI Z87.1-2020 to the following test protocol: ANSI Z87.1-2020 Spectacle Variant General Requirements.

Detailed test results are included.

**Final Conclusion:**

The Spectacles: NEON (Smoke Lens, Gray Temples (+S)) do comply with ANSI Z87.1-2020 for the test(s) included in this report.

COLTS makes all statements of conformity (Pass/Fail) based on actual values reported, unless otherwise stated.

Please contact us should you have any questions concerning this report.

**Respectfully submitted,**

COLTS Laboratories

Daryl Neely  
Vice-President & COO

Dale Payne  
Technical Services Manager

Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-03



Sample ID:  
 NEON  
 Smoke Lens, Gray Temples (+S)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

## Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Optical Quality	5.1.1	Protector lenses shall be free of: striae, bubbles, waves and other visible defects which would impair the wearer's vision.	Acceptable	Pass
Spectacle - Refractive Power, Astigmatism, Resolving Power, Prism and Prism Imbalance for Plano Protectors	5.1.4	The tolerance on refractive power, astigmatism, resolving power, prism and prism imbalance shall be as indicated below. Filter lenses of shade 9 or higher are exempt from this section.		
		Refractive Power ( $\pm 0.06$ )	Acceptable	Pass
		Left Eye	+0.02	Pass
		Right Eye	+0.03	Pass
		Astigmatism (0.06 Max)	Acceptable	Pass
		Left Eye	0.06	Pass
		Right Eye	0.06	Pass
		Resolving Power (Pattern 20)	Acceptable	Pass
		Left Eye	Acceptable	Pass
		Right Eye	Acceptable	Pass
		Complete Prism (0.50 Max)	Acceptable	Pass
		Left Eye	0.112	Pass
		Right Eye	0.212	Pass
		Prismatic Imbalance	Acceptable	Pass
		Vertical (0.25 Max)	0.05	Pass
		Horizontal Base In/Out (In 0.25 Max; Out 0.50 Max)	0.10 in	Pass
Physical Requirements	5.2	Protectors shall be free from: projections, sharp edges or other defects which are likely to cause discomfort or injury during use.	Acceptable	Pass
Ignition (Spectacle)	5.2.2	Protectors shall not ignite or continue to glow once the rod is removed. Each externally exposed material (exclusive of metals, textiles or elastic bands) shall be tested.		
		Lens	Acceptable	Pass
		Front	N/A	N/A
		Temple	Acceptable	Pass
		Other	N/A	N/A

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Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-03



Sample ID:  
 NEON  
 Smoke Lens, Gray Temples (+S)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

## Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Corrosion Resistance of Metal Components	5.2.3	<p>Metal components used in protectors shall be corrosion resistant to the degree that the function of the protector shall not be impaired by the corrosion and the protector can be worn as intended. Lenses and electrical components are excluded from these requirements.</p> <p>Corrosion Resistant</p>	Acceptable	Pass
Minimum Coverage Area	5.2.4	<p>Protectors shall cover an area of not less than 40 mm in width and 33 mm in height (elliptical) in front of each eye, centered on the pupil centers of the test headform.</p> <p>Protectors designed for small head sizes shall cover an area of not less than 34 mm in width and 28 mm in height (elliptical), centered on the pupil centers of the test headform.</p> <p>Minimum Coverage Area</p>	Acceptable	Pass
Placement of Markings (Spectacles)	5.3.2	<p>All protectors shall bear the permanent and legible markings in specified locations.</p> <p>Markings for lens type and use applications shall be required only when claims for protection against the hazard or indicated use are made by the manufacturer.</p> <p>Protector markings shall be placed in relatable proximity to each other on the product in the sequence specified below:</p> <p>Markings permanent, legible and in relatable proximity and in the correct sequence.</p> <p>Markings representative of other standards shall not interfere with or be intermixed with the markings required by this standard.</p> <p>Complete Device Markings</p> <p>Manufacturer's Mark or Logo</p> <p>Z87 Mark (Z87-2 for Rx)</p> <p>+ Mark</p> <p>Lens Type (multiple claim sequence W,U,L,R,V,S)</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
<u>Markings not assessed per customer request</u>				
Aftermarket Components and Accessories	5.6	<p>All original equipment manufacturers (OEM) and non-OEM aftermarket components or accessories not sold with the original device shall be tested.</p> <p>The entity claiming compliance of the component or accessory is responsible for testing the original complete device assembled with the components or accessories and shall provide evidence of compliance upon request.</p> <p>Aftermarket Components and Accessories</p>	Manufacturer requirement	Not testable

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Report To: LIBUS PPE  
Project No: Z-LIB111220-03-03



Sample ID:  
NEON  
Smoke Lens, Gray Temples (+S)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
Lab Rh: 55

## Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Special Purpose Filter Lenses - Transmission Requirements	7.2.2.1.1	Special purpose filters shall comply with requirements of Table 11.		
		Special purpose filters shall be tested directly in front of each eye and at the thinnest edge of the lens no closer than 5 mm from the lens edge.		
		Tinted Lenses (8% - 100%)	Acceptable	Pass
		Left Eye	20.3%	Pass
Right Eye	21.2%	Pass		
		Ratio (0.90 - 1.10)	0.958	Pass

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**Report  
Summary**

A2LA Accredited Certificate # 1612.01

**Report To:**

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Berazategui, Bs.As. Argentina

**Project**

of Model(s): NEON  
Report of: ANSI Z87.1-2020  
Project ID(s): Z-LIB111220-03-04



**Attn:** Miguel Caro

**Date:** December 23, 2020

**Product Description:** Smoke Lens, Gray Temples (+)

On November 12, 2020, COLTS Laboratories received Spectacles: NEON from LIBUS PPE . From November 30, 2020 through December 22, 2020 COLTS Laboratories tested these Spectacles in accordance with ANSI Z87.1-2020 to the following test protocol: ANSI Z87.1-2020 Spectacle Optional Claim (+).

Detailed test results are included.

**Final Conclusion:**

The Spectacles: NEON (Smoke Lens, Gray Temples (+)) do comply with ANSI Z87.1-2020 for the test(s) included in this report.

COLTS makes all statements of conformity (Pass/Fail) based on actual values reported, unless otherwise stated.

Please contact us should you have any questions concerning this report.

**Respectfully submitted,**

COLTS Laboratories

Daryl Neely  
Vice-President & COO

Dale Payne  
Technical Services Manager

Report To: LIBUS PPE  
 Project No: Z-LIB111220-03-04



Sample ID:  
 NEON  
 Smoke Lens, Gray Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

### Report of: ANSI Z87.1-2020

Test/Property	Paragraph	Requirement	Test Results	Acceptance
Lateral (Side) Coverage	7.1.3	Impact-rated protectors shall provide continuous lateral coverage. The probe shall not contact the headform within the defined coverage area. Lateral (Side) Coverage	Acceptable	Pass
High Mass Impact	7.1.4.2	The complete device shall meet the protector acceptance criteria when impacted by a pointed projectile weighing a minimum of 500 g (17.6 oz) dropped from a height of at least 127 cm (50.0 in.).  The lens shall fail if any of the following occurs: <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained</li> </ul>		
		Left Eye Sample 1	Acceptable	Pass
		Left Eye Sample 2	Acceptable	Pass
		Right Eye Sample 3	Acceptable	Pass
		Right Eye Sample 4	Acceptable	Pass
High Velocity Impact (Spectacle)	7.1.4.3	The complete device shall meet the protector acceptance criteria when impacted by a 6.35 mm (0.25 in) diameter steel ball traveling at a minimum of 150 feet per second.  When tested in accordance with this section, the lens shall fail if any of the following occurs: <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained;</li> <li>the unaided eye observes any piece adhering to the contact paste, or observes contact paste on the projectile or complete device.</li> </ul>		
		Left Eye Center	155 fps	Pass
		Left Eye 30°	155 fps	Pass
		Right Eye Center	155 fps	Pass

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Report To: LIBUS PPE  
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Sample ID:  
 NEON  
 Smoke Lens, Gray Temples (+)

A2LA Accredited Certificate # 1612.01

Report Date: 12/23/2020

Lab Temp (C): 23  
 Lab Rh: 55

**Report of: ANSI Z87.1-2020**

Test/Property	Paragraph	Requirement	Test Results	Acceptance	
High Velocity Impact (Spectacle)	7.1.4.3	<p>The complete device shall meet the protector acceptance criteria when impacted by a 6.35 mm (0.25 in) diameter steel ball traveling at a minimum of 150 feet per second.</p> <p>When tested in accordance with this section, the lens shall fail if any of the following occurs:</p> <ul style="list-style-type: none"> <li>any part, fragment or material visible to the unaided eye becomes detached from the inner surface of any complete device, as determined by inspection of the device or of the contact paste;</li> <li>fracture;</li> <li>penetration of the inner surface either by the projectile passing completely through the lens, frame or housing component, or by rupture of the inner lens surface;</li> <li>lens not retained;</li> <li>the unaided eye observes any piece adhering to the contact paste, or observes contact paste on the projectile or complete device.</li> </ul>			
			Right Eye 30°	155 fps	Pass
			One Side 90° at 10mm Above (H - 8mm)	155 fps	Pass
			Opposite Side 90° at 10mm Below (H - 8mm)	155 fps	Pass
Penetration Test (lenses only)	7.1.4.4	<p>Lenses for all complete devices shall meet the protector acceptance criteria when penetrated by a weighted needle with a minimum total weight of 44.2 g (1.56 oz) dropped from a height of at least 127 cm (50.0 in.).</p>			
			Left Eye Sample 1	Acceptable	Pass
			Left Eye Sample 2	Acceptable	Pass
			Right Eye Sample 3	Acceptable	Pass
			Right Eye Sample 4	Acceptable	Pass

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## APPENDIX 1

### ANSI Z87.1 - 2020 Measurement Uncertainty Values

Section	Requirement	Uncertainty
5.1.2	Luminous Transmittance	0.19%
5.1.3	Haze	0.08%
5.1.4	Refractive Power	0.018D
	Astigmatism	0.018D
	Prism	0.048Δ
5.4.5	Minimum Lens Thickness	0.012 mm
5.5.1	Replaceable Lenses – Goggles	0.17 mm
5.5.2	Replaceable Lenses – Welding Helmets and Handshields	0.17 mm
6.1	Relaxed Optics Level	See 5.1.4
6.2	Anti-Fog Properties	1.79%
7.2.1	Optical Radiation - Clear Lenses	See 5.1.2
7.2.2.1.1	Transmission Requirements	
	Table 7 (Welding Filters)	
	W1.3 – W3.0	See 5.1.2
	W4	0.0018287%
	W5	0.0003283%
	W6	0.0003605%
	W7	0.0000961%
	W8	0.0001944%
	W9	0.0000459%
	W10	0.0000707%
	W11	0.0000163%
	W12	0.0000055%
	W13	0.0000029%
	W14	0.0000017%
	EFUV	0.0000551%
	NUV	0.0000576%
	IR	0.010395%
	Table 8 (UV Filters)	
	EFUV	0.0000551%
	NUV	0.0000576%
	Table 9 (IR Filters)	0.010395%
	Table 10 (VIS Filters)	See 7.2.2.1.1 W1.3 – W10
	Table 11 Tinted	See 5.1.2
	Extra Dark	See 5.1.2
7.2.2.1.2	Visible Light Filters	
	Visible Light (L1.3 - L3)	See 5.1.2
	UVA	See Table 7 NUV
	UVB	See Table 7 EFUV
7.2.2.2	Transmittance of Non-lens Components	See 7.2.2.1.1 Table 7, 8 & 9
7.2.3.1	Automatic Darkening Welding Filter Lenses - Luminous Transmittance	See 7.2.2.1.1 Table 7
7.2.3.2	Automatic Darkening Welding Filter Lenses - UV/IR Transmittance	See 7.2.2.1.1 Table 7
7.2.3.3	Switching Index	0.0192 mSec
7.2.3.5	Angular dependence of luminous transmittance	See 7.2.2.1.1 Table 7